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Rozenn Nicol

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DRINKER BIDDLE & REATH LLP
ATTN: PATENT DOCKET DEPT.
191 N. WACKER DRIVE, SUITE 3700
CHICAGO, IL 60606

EXAMINER

PAUL, DISLER

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

Response to the amendment

The applicant's amended claims as in (17-23) have been fully considered and is rejected over prior art as in Sekine (US 2002/0164037 A1).

In regard to the amended claims 17, it is noted that Sekine disclose of a method for operating a device for generating a synthesized and spatialized acoustic signal comprising: receiving by a receiver of the device a command for synthesizing and spatializing a sound associated to a virtual source being disposed at a given position relative to a predetermined origin (fig.1 (2,5); fig.3 (16L, 16R); par [0027, 0031, 0046, 0051, 0066] /having the virtual sound image relative to a predetermined origin as being the headphone of the listener) and the sound not being received by the device and being defined at least by a frequency of its fundamental mode , a duration and an intensity (par [0050, 0079, 0084]/the sound being defined by tone volume as in intensity and inherently such duration of the volume and frequency mode with synthesizer and to create the virtual sound which is not received by the device) and calculating by a computer of the device a gain based on the intensity of the sound and the given position of the virtual source relative to the origin (par [0073, 0079, 0084]/the gain coefficient is determined based on the distance between the listener and sound position and including the sound level/volume as in intensity); and outputting, by an output of the device, a synthetic sound signal representing virtual acoustic source at the given position, said signal being defined at least by the gain calculated by the computer (fig.1

(3); fig.3 (18; 121-128); fig.4; par [0055; 0057]/the output device to generate the synthetic sound and including the gain signal as calculated).

The Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 3; 9; 17-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Sekine (US 2002/0164037 A1).

Claim 17, Sekine disclose of a method for operating a device for generating a synthesized and spatialized acoustic signal comprising: receiving by a receiver of the device a command for synthesizing and spatializing a sound associated to a virtual source being disposed at a given position relative to a predetermined origin (fig.1 (2,5); fig.3 (16L, 16R); par [0027, 0031, 0046, 0051, 0066] /having the virtual sound image relative to a predetermined origin as being the headphone of the listener) and the sound

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not being received by the device and being defined at least by a frequency of its fundamental mode , a duration and an intensity (par [0050, 0079, 0084]/the sound being defined by tone volume as in intensity and inherently such duration of the volume and frequency mode with synthesizer and to create the virtual sound which is not received by the device) and calculating by a computer of the device a gain based on the intensity of the sound and the given position of the virtual source relative to the origin (par [0073, 0079, 0084]/the gain coefficient is determined based on the distance between the listener and sound position and including the sound level/volume as in intensity); and outputting, by an output of the device, a synthetic sound signal representing the virtual acoustic source at the given position, said signal being defined at least by the gain calculated by the computer (fig.1 (3); fig.3 (18; 121-128); fig.4; par [0055; 0057]/the output device to generate the synthetic sound and including the gain signal as calculated).

Claim 18, the method as claimed in claim 17, in which a plurality of virtual sources to be synthesized and spatialized are provided, wherein each source is assigned to a respective position (fig.13; par [0073]).

Claim 19, Sekine disclose of a synthesis engine for synthesizing and spatializing an acoustic signal, comprising: a receiver for receiving a command for synthesizing and spatializing a sound associated to a virtual source being disposed at a given position relative to a predetermined origin (fig.1 (2,5); fig.3 (16L, 16R); par [0027, 0031, 0046,

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0051, 0066] /having the virtual sound image relative to a predetermined origin as being the headphone of the listener), the sound not being received by the device and being defined at least by a frequency of its fundamental mode, a duration, and an intensity (par [0050, 0079, 0084]/the sound being defined by tone volume as in intensity and inherently such duration of the volume and frequency mode with synthesizer and to create the virtual sound which is not received by the device); a computer for calculating a gain based on the intensity of the sound and the given position of the virtual source relative to the origin (par [0073, 0079, 0084]/the gain coefficient is determined based on the distance between the listener and sound position and including the sound level/volume as in intensity); and an output for outputting a synthetic sound signal representing the virtual acoustic source at the given position, said signal being defined at least by the gain calculated by the computer (fig.1 (3); fig.3 (18; 121-128); fig.4; par [0055; 0057]/the output device to generate the synthetic sound and including the gain signal as calculated).

Claim 20, Sekine disclose of a synthesis engine according to claim 19, further comprising: a man-machine interface implemented in a music editing context to place the virtual source in a chosen position relative to a predetermined origin, to define the command for synthesizing and spatializing (fig.1 (1-2);fig.13; par [0038, 0041]/ the virtual sound relative to a listener).

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Claim 21, Sekine disclose of a device for generating a synthesized and spatialized acoustic signal, comprising a processor, wherein the device also includes a working memory for storing processor readable instructions for implementing an acoustic synthesis and spatialization method for operating the device, said method comprising: receiving a command for synthesizing and spatializing a sound associated to a virtual source being disposed at a given position relative to a predetermined origin (fig.1 (2,5); fig.3 (16L, 16R); par [0027, 0031, 0046, 0051, 0066] /having the virtual sound image relative to a predetermined origin as being the headphone of the listener), the sound not being received by the device and being defined at least by a frequency of its fundamental mode, a duration, and an intensity (par [0050, 0079, 0084]/the sound being defined by tone volume as in intensity and inherently such duration of the volume and frequency mode with synthesizer and to create the virtual sound which is not received by the device); calculating a gain based on the intensity of the sound and the given position of the virtual source relative to the origin (par [0073, 0079, 0084]/the gain coefficient is determined based on the distance between the listener and sound position and including the sound level/volume as in intensity); and outputting a synthetic sound signal representing the virtual acoustic source at the given position, said signal being defined at least by the calculated gain (fig.1 (3); fig.3 (18; 121-128); fig.4; par [0055; 0057]/the output device to generate the synthetic sound and including the gain signal as calculated).

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Claim 22, Sekine disclose of a computer program product, stored in a computer usable memory of a central processing unit or a terminal, or on a computer usable removable medium specifically for cooperating with a drive of said central processing unit, comprising instructions for implementing a method for operating a device for generating a synthesized and spatialized acoustic signal, said method comprising:

receiving by reception means of the device a command for synthesizing and spatializing a sound associated to a virtual source being disposed at a given position relative to a predetermined origin (fig.1 (2,5); fig.3 (16L, 16R); par [0027, 0031, 0046, 0051, 0066] /having the virtual sound image relative to a predetermined origin as being the headphone of the listener), the sound not being received by the device and being defined at least by a frequency of its fundamental mode, a duration, and an intensity (par [0050, 0079, 0084]/the sound being defined by tone volume as in intensity and inherently such duration of the volume and frequency mode with synthesizer and to create the virtual sound which is not received by the device); calculating a gain based on the intensity of the sound and the given position of the virtual source relative to the origin (par [0073, 0079, 0084]/the gain coefficient is determined based on the distance between the listener and sound position and including the sound level/volume as in intensity); and outputting a synthetic sound signal representing the virtual acoustic source at the given position, said signal being defined at least by the gain calculated by the computing means (fig.1 (3); fig.3 (18; 121-128); fig.4; par [0055; 0057]/the output device to generate the synthetic sound and including the gain signal as calculated).

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Claim 23, Sekine disclose of a communication terminal, including a device for generating synthetic sounds comprising a processor and a working memory for storing processor readable instructions for implementing a method for operating a device for generating a synthesized and spatialized acoustic signal, said method comprising: receiving a command for synthesizing and spatializing a sound associated to a virtual source being disposed at a given position relative to a predetermined origin (fig.1 (2,5); fig.3 (16L, 16R); par [0027, 0031, 0046, 0051, 0066] /having the virtual sound image relative to a predetermined origin as being the headphone of the listener) , the sound not being received by the device and being defined at least by a frequency of its fundamental mode, a duration, and an intensity (par [0050, 0079, 0084]/the sound being defined by tone volume as in intensity and inherently such duration of the volume and frequency mode with synthesizer and to create the virtual sound which is not received by the device); calculating a gain based on the intensity of the sound and the given position of the virtual source relative to the origin (par [0073, 0079, 0084]/the gain coefficient is determined based on the distance between the listener and sound position and including the sound level/volume as in intensity); and outputting a synthetic sound signal representing the virtual acoustic source at the given position, said signal being defined at least by the gain (fig.1 (3); fig.3 (18; 121-128); fig.4; par [0055; 0057]/the output device to generate the synthetic sound and including the gain signal as calculated).

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Claim 3, the method as claimed in claim 17, in which the synthetic sound is intended to be reproduced in a holophonic, or binaural, or transaural context, on a plurality of reproduction channels (fig.3; par [0034]/ to be reproduced in a binaural and plurality of reproduction channel), wherein, during said joint step, the method further comprising: calculating a delay between reproduction channels is also determined, to define at the same time: a triggering instant of the sound characterizing the nature of the source, and the position of the source relative to a predetermined origin (fig.3 (11); fig.13; par [0044]/the gain in determined the position with respect to listener and the characteristic of the source).

Claim 9, the method as claimed in claim 17, wherein the nature of the virtual source is parameterized by at least one acoustic timbre, by associating the chosen relative loudnesses with harmonics of a frequency corresponding to a pitch of the sound (par [0079]/frequency with harmonic synthesis on the tone signal).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sekine (US 2002/0164037 A1).

Claim 2, the method as claimed in claim 17, in which the spatialization of the virtual source is performed in an ambisonic context, further comprising: a step for calculating gains associated with ambisonic components in a harmonics base (fig.1(1-2); fig.13; fig.3 (121-128); par [0037]/the ambisonic/surround context in calculating the gains in a harmonic base).

Similarly, it would have been obvious for one of the ordinary skills in the art to have tried in modifying the harmonic base as additionally including such sphere harmonic base with producing no unexpected result and thus merely based on the designer's preference.

Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekine (US 2002/0164037 A1) and Tamura (US 6,184,455 B1).

Claim 4, the method as claimed in claim 3, wherein the nature of the virtual source is parameterized at least by a loudness signal (fig.3 (121-128); par [0066]). But, Sekine fail to disclose of wherein the nature of the source is parameterized at least by a

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temporal loudness variation, over a chosen duration and including a sound triggering instant.

But, Tamura disclose of a system wherein the similar concept of wherein the nature of the source is parameterized at least by a temporal loudness variation, over a chosen duration and including a sound triggering instant (fig.25 A; col.32 line 30-45/instant triggering based on key-on event and having temporal loudness variation) so as to provide a smooth operation on the tone volume parameter. Thus, it would have been obvious for one of the ordinary skill in the art to have modified the prior art with having such wherein the nature of the source is parameterized at least by a temporal loudness variation, over a chosen duration and including a sound triggering instant so as to provide a smooth operation on the tone volume parameter.

Claim 5, the method as claimed in claim 4, wherein said variation comprises at least: -an instrumental attack phase, -a decay phase, -a sustain phase, and -a release phase (fig.25 A; col.32 line 30-45).

Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekine (US 2002/0164037 A1) and Chen (US 6,990,205 B1).

Claim 6, the method as claimed in claim 3, wherein the spatialization of the virtual source is performed by a binaural synthesis based on a breakdown of transfer functions (fig.3 (151-158, 16L , 16R); par [0028, 0052]/breakdown of transfer function in synthesizing).

But, Sekine fail to disclose of wherein such a linear breakdown of transfer functions, these transfer functions being expressed by a linear combination of terms dependent on the frequency of the sound and weighted by terms dependent on the direction of the sound.

But, Chen disclose of a system wherein such a linear breakdown of transfer functions, these transfer functions being expressed by a linear combination of terms dependent on the frequency of the sound and weighted by terms dependent on the direction of the sound (col.7 line 35-col.8 line 35/spatial attribute of multiple source to be positioned at a spatial direction and having weighed term dependent on direction of sound and linear combination of terms) so as to positioned the different sources with respect to the listener. Thus, it would have been obvious for one of the ordinary skill in the art to have modified the prior art with implementing the linear breakdown of transfer functions, these transfer functions being expressed by a linear combination of terms dependent on the frequency of the sound and weighted by terms dependent on the direction of the sound so as to positioned the different sources with respect to the listener.

Claim 7, the method as claimed in claim 6, wherein the direction is defined by at least one bias angle and, preferably, by a bias angle and an elevation angle (col.3 line 23-26; col.6 line 15-30/angle and elevation in determining the direction).

Claim 8, the method as claimed in claim 6, wherein the position of the virtual source is parameterized at least by: a number of filterings, dependent on the acoustic frequency and a number of weighting gains each associated with a filtering (Sekine, fig.3 (121-128, 151-158); par [0048]), and a delay for each "left" and "right" channel (fig.3 (11), par [0050]).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DISLER PAUL whose telephone number is (571)270-1187. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. P./

Examiner, Art Unit 2614

/Xu Mei/

Primary Examiner, Art Unit 2614